

Work Order ID 72384

Monday, July 25, 2011 8:46:43 AM

Page 1

Item ID: D212-664-201TRN

Accept

Setup Start

Revision ID: ~~U/R~~ *18*

Stop

Item Name: Crosstube Turning Detail

Start Date: 7/25/2011 Start Qty: 1.00

Cust Item ID:

Required Date: 8/2/2011 Req'd Qty: 1.00

Customer:

Reference:

Approvals:

Process Plan: *11*

Date: *11-07-25*

Tooling:

Date:

Run Start

QC:

Date:

SPC (Y/N):

Date:

Stop

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

Draw Nbr

Revision Nbr

D212-664-241

Rev *D* U/R

100

0.00



Mori Seiki

MORI SEIKI CNC LATHE LARGE

Memo

0.00

Mori Seiki CNC Lathe Large

1-Fill tube with sand & install plugs DT8534 on both ends as per Folio FA114

2-Turn first side as per Folio FA114

3-Blend transition lines only, **do not sand whole tube**

*Use mill bastard file, brush file repeatedly with file card.

*Do not use sandpaper coarser than 320 grit.

MM-C 11/07/25

110

QC1- Inspect dimensions to dimension sheet

0.00



QC

Memo

0.00

Quality Control

22 11-7-25

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Work Order ID 72384

Monday, July 25, 2011 8:46:43 AM

Page 2

Item ID: D212-664-201TRN

Accept

Revision ID: U/R

Item Name: Crosstube Turning Detail

Start Date: 7/25/2011 Start Qty: 1.00

Required Date: 8/2/2011 Req'd Qty: 1.00

Reference:

Cust Item ID:

Customer:

Approvals:

Process Plan:

Date:

Tooling:

Date:

QC:

Date:

SPC (Y/N):

Date:

Run

Start

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

120



Mori Seiki

Mori Seiki CNC Lathe Large

MORI SEIKI CNC LATHE LARGE

Memo

1-Turn second side as per Folio FA114

2-Blend transition lines only, **do not sand whole tube**:

*Use mill bastard file, brush file repeatedly with file card.

*Do not use sandpaper coarser than 320 grit.

3-Remove sand and plugs

4- scribe batch # and part # as per dwg

0.00

0.00

0.00

0.00

130



QC

Quality Control

QC1- Inspect dimensions to dimension sheet

Memo

29 11-7-26

1 0

MM-L 11/07/25

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Work Order ID 72384

Monday, July 25, 2011 8:46:43 AM



Page 3

Item ID: D212-664-201TRN

Accept



Setup Start



Revision ID: U/R

Item Name: Crosstube Turning Detail

Stop



Start Date: 7/25/2011 Start Qty: 1.00



Cust Item ID:

Required Date: 8/2/2011 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

140

QC8- Inspect parts - second check

0.00




QC

Memo

0.00

Quality Control

 11-07-27 1 4

150

Crosstubes Chemical Conversion

0.00



HandFXtube

Memo

0.00

Hand Finishing Crosstubes

Chemical Conversion Coat as per within 24 hours of machining

SAD 11-07-26 (1)

160

QC3- Inspect Part Finish

0.00




QC

Memo

0.00

Quality Control

 11-7-26

Work Order ID 72384

Monday, July 25, 2011 8:46:43 AM



Page 4 (

Item ID: D212-664-201TRN

Accept



Setup Start



Revision ID: U/R

Item Name: Crosstube Turning Detail

Stop



Start Date: 7/25/2011 Start Qty: 1.00



Cust Item ID:

Required Date: 8/2/2011 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

170

0.00



Packaging

Packaging

Memo

0.00

Packaging

Identify and stock in kanban rack
Location: -46

11-7-26

180

0.00



QC21- Final Inspection - Work Order Release

QC

Memo

0.00

Quality Control

11/7/29

11-07-27

Picklist Print

Monday, July 25, 2011 8:46:51 AM

Page 1

Work Order ID: 72384



Parent Item: D212-664-201TRN



Parent Item Name: Crosstube Turning Detail


Start Date: 7/25/2011

Required Date: 8/2/2011

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP Rev:A 08-03-06 new issue DD verified by:ec
IPP Rev B 08.04.02 Removed polish EC verified DD

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D6006-129  Crosstube Material		Manufactured	No			120	Each	21.3000	1	1			



Location

Loc Qty

Loc Code

LG	21.3	
23970	2	
26550	15	
29112	1.3	
34690	3	

1 mgt. L 11/07/25

DART AEROSPACE LTD		Work Order:	77384
Description: Crosstube Assembly (205/212 High Aft)		Part Number:	D212-664-241
Inspection Dwg: D212-664-241 Rev: D		Page 1 of 1	

FIRST ARTICLE INSPECTION CHECKLIST

Inspection Sheet Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
SIDE A	0.200	+/-0.010	✓		vern	JF-01
	R0.063	+/-0.010	✓		RG	
	2.990	+0.005/-0.000	✓		micr	CNC-04
	5.237	+/-0.030	✓		vern	JF-01
	2.600	+0.005/-0.000	✓		micr	CNC-04
	2.686	+0.005/-0.000	✓		II	
	2.770	+0.005/-0.000	✓		II	
	2.854	+0.005/-0.000	✓		II	
	2.938	+0.005/-0.000	✓		II	
	3.021	+0.005/-0.000	✓		micr	CNC-05
	3.133	+0.005/-0.000	✓		II	
	3.179	+0.005/-0.000	✓		II	
SIDE B	0.200	+/-0.010	✓		vern	JF-01
	R0.063	+/-0.010	✓		RG	
	2.990	+0.005/-0.000	✓		micr	CNC-04
	5.237	+/-0.030	✓		vern	JF-01
	2.600	+0.005/-0.000	✓		micr	CNC-04
	2.686	+0.005/-0.000	✓		II	
	2.770	+0.005/-0.000	✓		II	
	2.854	+0.005/-0.000	✓		II	
	2.938	+0.005/-0.000	✓		II	
	3.021	+0.005/-0.000	✓		micr	CNC-05
	3.133	+0.005/-0.000	✓		II	
	3.179	+0.005/-0.000	✓		II	
	124.362	+/-0.020	✓		tape	MMIL-04

Measured by: MAM.L ^{2R}	Audited by: [Signature]	Preliminary Approval:	N/A
Date: 11/07/25	Date: 11/07/27	Date:	N/A

Rev	Date	Change	Revised by	Approved
A	05.04.27	New Issue (P/O D412-664-201)	KJ/JLM	
B	06.03.09	Tolerance for 5.237 was +/-0.001	KJ/JLM	
C	07.05.08	Dwg Rev. updated	KJ/JLM	
D	10.08.03	Dimension 124.362 was 124.36	KJ	[Signature]

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Item	Qty -241	Qty -241B	Part Number	Description
1	X		D212-664-241	CROSSTUBE ASSEMBLY (205/212 HIGH AFT)
2		X	D212-664-241B	CROSSTUBE ASSEMBLY (214 HIGH AFT)
3	1	1	D6006-129	CROSSTUBE
4	2	2	D2940-1	SUPPORT
5	4	4	D3595-063-530	RUBBER CUSHION
6	4	4	MS21920-28	CLAMP (OR MS21920-30)
7	A/R	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)

GENERAL NOTES:

- MATERIAL: MANUFACTURED FROM D6006-129
FINISHED LENGTH = 124.362±0.020
- FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- UNITS: INCHES UNLESS OTHERWISE NOTED.
- BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- IDENTIFICATION: SCRIBE DART PART NUMBER "D212-664-XXX" AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS.
- WEIGHT: D212-664-241 = 44.2 lbs (PER IIN-D212-664)
D212-664-241B = 44.2 lbs (PER IIN-D212-664)
- PART IS SYMMETRIC ABOUT CENTERLINE.
- RUN CUTTER OFF PART. BLEND OUT EDGE LONGITUDINALLY. TRANSITION SHOULD BE SMOOTH.
- BEND PROGRESSIVELY WITH A MINIMUM OF 5 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- INSTALL D2940-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2940-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- INSTALL MS21920-28 CLAMPS (OR -30) WITH D3595-063-530 RUBBER CUSHIONS TO SECURE THE D2940-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE OF CROSSTUBE SUPPORT.
- EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

SHOP COPY
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO. 12389

11/07/25

UNDER REVIEW

DEO ATTACHED

RELEASED
2009-10-29

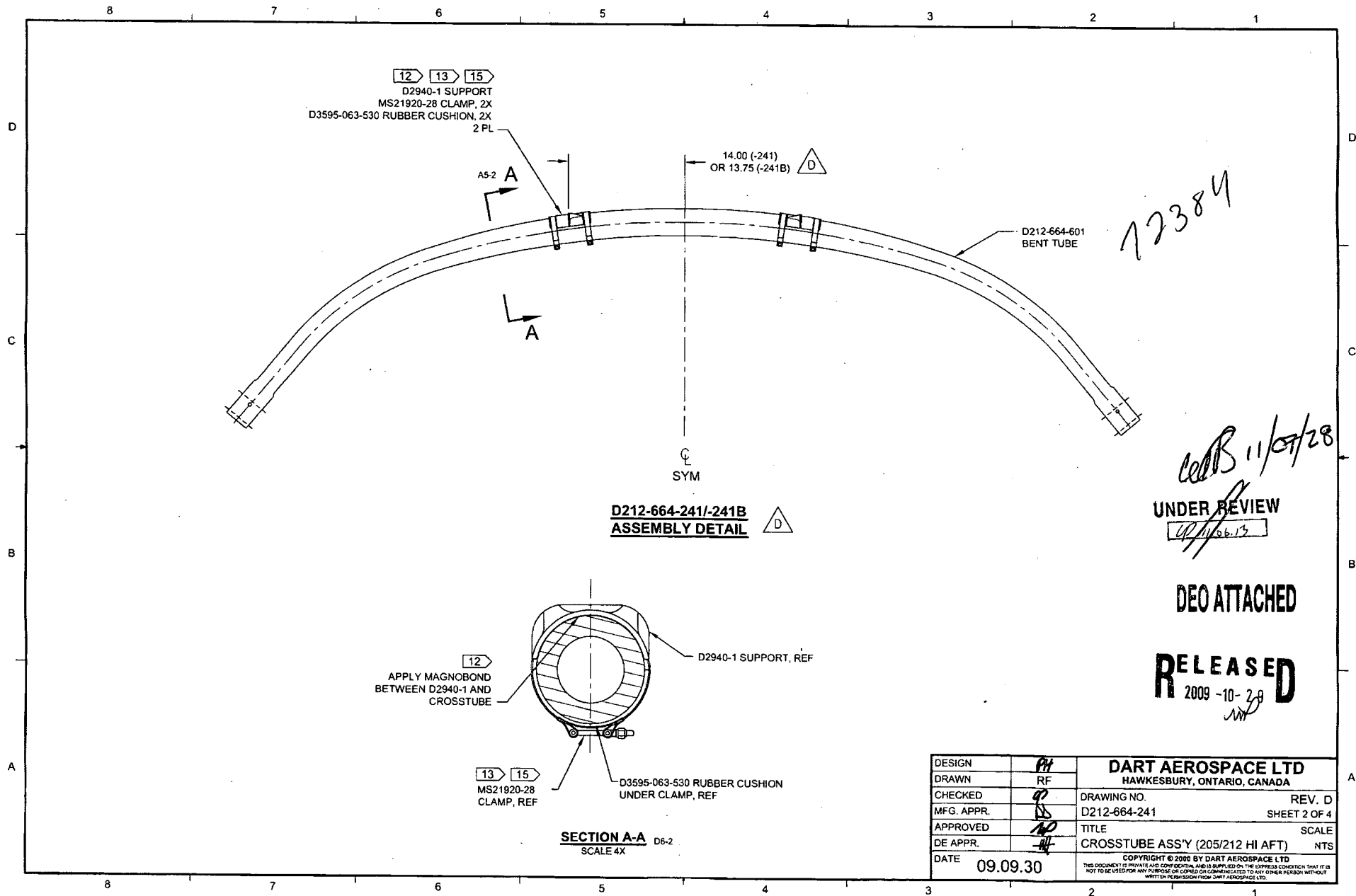
D	REFORMAT/REVISE GENERAL NOTES/PART LIST; REORGANIZED VIEWS AND REFORMATTED DRAWING TO CURRENT STANDARDS; ADD -241B (ZN D4-2, B4-2); REMOVED REF & ADD TOLERANCES (ZN D8-3 & C4-3, C6-3 & A8-3); RELOCATED FLAG #6 PER PAR 08-046 (ZN A5-3); MOVED TURNING DETAIL & UPDATED TOLERANCE TO SHEET 4	RF	09.09.30
C	REMOVE -1009 ABRASION STRIP; ADD MAGNOBOND 6398, CUSHION, REVERSE CLAMPS	PH	07.03.08
B	ADD HOLES FOR COMPATABILITY WITH BHT/AA SKIDTUBES	PH	05.02.04
A	NEW ISSUE	PH	00.12.12
REV.	DESCRIPTION	BY	DATE
DESIGN	PH		
DRAWN	RF		
CHECKED	PH		
MFG. APPR.	PH		
APPROVED	PH		
DE APPR.	PH		
DATE	09.09.30		

DART AEROSPACE LTD
HAWKESBURY, ONTARIO, CANADA

DRAWING NO. REV. D
D212-664-241 SHEET 1 OF 4

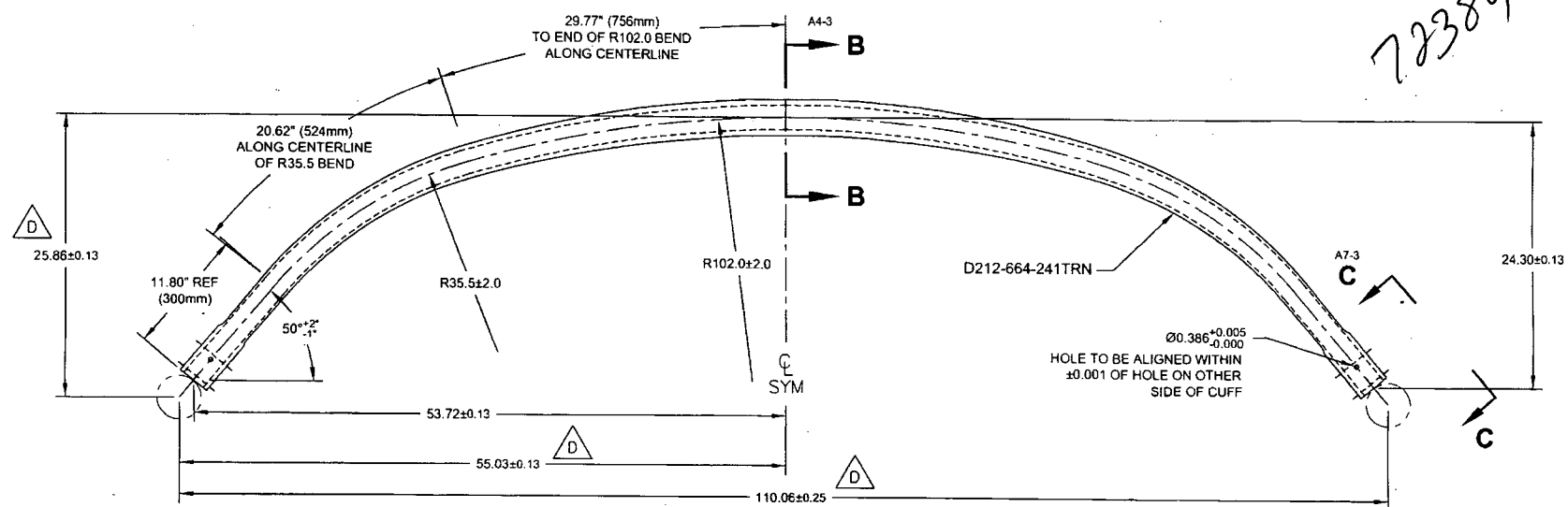
TITLE SCALE
CROSSTUBE ASS'Y (205/212 HI AFT) NTS

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72384

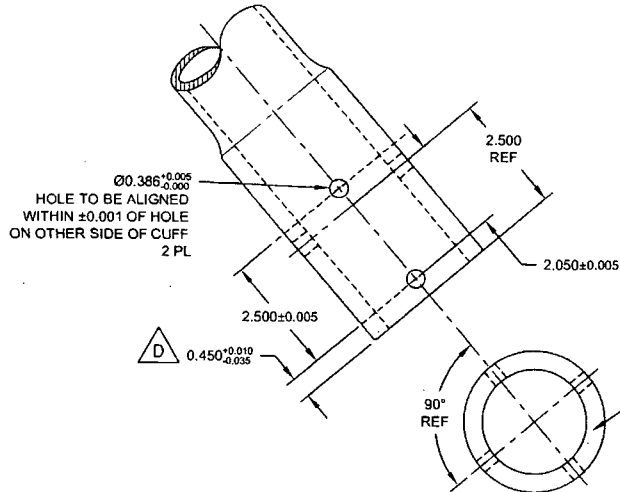


D212-664-601 10 D
BENDING AND DRILLING DETAIL

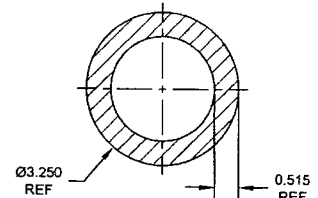
UNDER REVIEW
4/11.06.13

DEO ATTACHED

RELEASED
2009-10-28



VIEW C-C: CUFF DETAIL D2-3
SCALE 3X



SECTION B-B D4-3
SCALE 4X

DESIGN	PH	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	Q	DRAWING NO.	REV. D
MFG. APPR.	DS	D212-664-241	SHEET 3 OF 4
APPROVED	AP	TITLE	SCALE
DE APPR.	HL	CROSSTUBE ASS'Y (205/212 HI AFT)	NTS
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8 7 6 5 4 3 2 1

12384

R100.0 TRANSITION
BETWEEN TAPERED
SECTIONS

R100.0 TRANSITION
BETWEEN TAPERED
SECTIONS

0.515 WALL
STOCK, REF

SEE DETAIL D

0.000
2.600^{+0.005}_{-0.000}

11.795^{+0.030}_{-0.000}
16.950^{+0.030}_{-0.000}
22.105^{+0.030}_{-0.000}
27.260^{+0.030}_{-0.000}
32.415^{+0.030}_{-0.000}
38.284^{+0.030}_{-0.000}
42.114^{+0.030}_{-0.000}
46.114^{+0.030}_{-0.000}

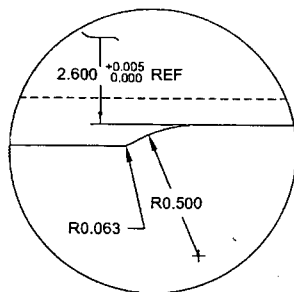
2.686^{+0.005}_{-0.000}
2.770^{+0.005}_{-0.000}
2.854^{+0.005}_{-0.000}
2.938^{+0.005}_{-0.000}
3.021^{+0.005}_{-0.000}
3.133^{+0.005}_{-0.000}
3.179^{+0.005}_{-0.000}

3.250
STOCK, REF
C SYM

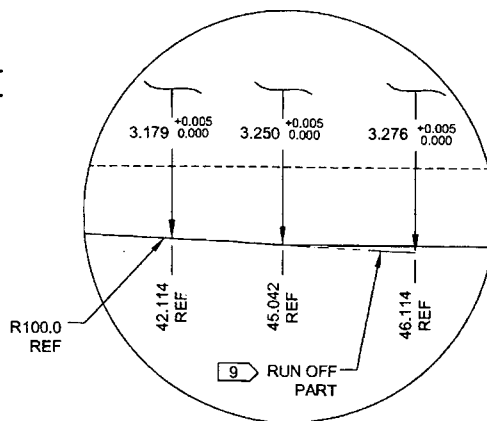
SEE DETAIL E
A4-4

TAPER UNIFORMLY FROM
THROUGH TO 3.276^{+0.005}_{-0.000}
RUNNING OFF PART

D212-664-241TRN
TURNING DETAIL

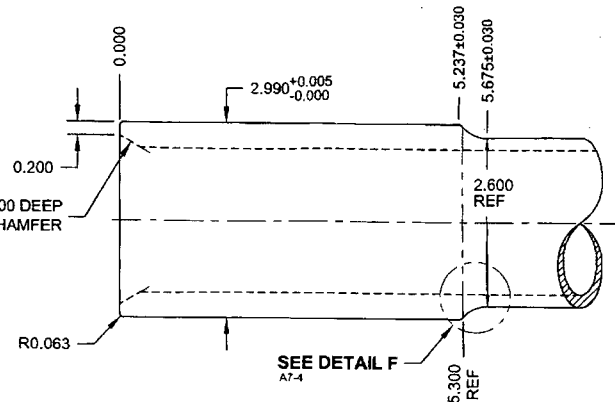


DETAIL F:
CUFF TRANSITION C2-4
SCALE 10X



DETAIL E:
TAPER RUN-OFF C5-4
NOT TO SCALE

30° X 0.500 DEEP
CHAMFER



DETAIL D:
CROSSTUBE CUFF D8-4
SCALE 5X

UNDER REVIEW
06.13

DEO ATTACHED

RELEASED
2009-10-29

DESIGN	PH	DART AEROSPACE LTD
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA
CHECKED	92	DRAWING NO.
MFG. APPR.	10	D212-664-241
DE APPR.	10	TITLE
DATE	09.09.30	CROSSTUBE ASS'Y (205/212 HI AFT)
		SCALE
		NTS

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DRAWING NO. D212-664-241	TITLE CROSSTUBE ASSY (205/212 HI AFT)	REV. D	DART AEROSPACE LTD. ENGINEERING ORDER		D.E.O. NO. D212-664-241-D-1	SHEET NO. SHEET 1 OF 2	SCALE NTS
DRAWN	CHECKED	MFG. APPR.	APPROVED	DE APPR.			
DATE 11.04.07	DATE 11.04.11	DATE 11.04.12	DATE 11/04/12	DATE 11.04.12			

PURPOSE:

ADD AN INSPECTION WINDOW TO UNDERSIDE OF CROSSTUBE.

CHANGE:

NOTES 2 OF SHEET 1 IS AMENDED AS FOLLOWS:

IS:

- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
MASK UNDERSIDE OF CROSSTUBE AS SHOWN (HATCHED AREA) AND
PAINT OUTSIDE PER DART QSI 005 4.2
REMOVE MASKING AND APPLY CLEAR COAT

WAS:

- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2

RELEASED
2011-04-18

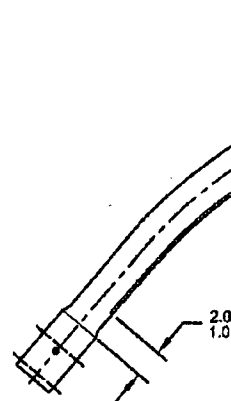
UNDER REVIEW

11/15/13

72384

DRAWING NO. D212-664-241	TITLE CROSSTUBE ASSY (205/212 HI AFT)	REV. D	DART AEROSPACE LTD ENGINEERING ORDER		D.E.O. NO. D212-664-241-D-1	SHEET NO. SHEET 2 OF 2	SCALE NTS
DRAWN	CHECKED <i>UP</i>	MFG. APPR. <i>E</i>	APPROVED <i>MD</i>		DE APPR. <i>MD</i>		
DATE 11.04.07	DATE 11.04.11	DATE 11.04.12	DATE 11/04/12		DATE 11.04.12		

IS:



WAS:

D212-664-601
BENT TUBE

72384

**D212-664-241/-241B
ASSEMBLY DETAIL**

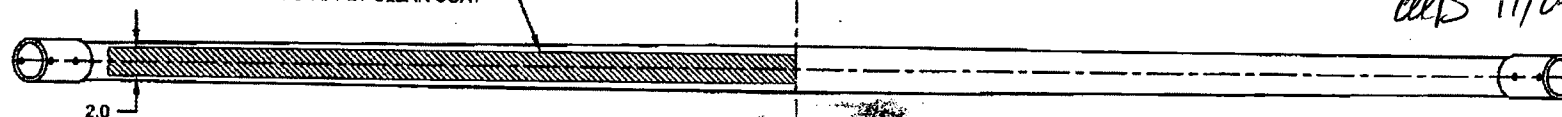
RELEASED
2011-04-18

UNDER REVIEW

UP 11.06.13

MD 11/07/28

MASK AREA PRIOR TO PAINTING,
REMOVE MASKING AFTER PAINT
AND APPLY CLEAR COAT



C
SYM

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